Pacific Packet Radio Society

Vol. I, No. 6 NEWSLETTER July, 1985

FROM THE EDITOR

This issue of the Newsletter is brief since there are not many contributors. Thanks to Stu Neblett and to Bill Danielson who are the only contributors to this issue. I would like to remind you that there is a deadline for copy of the third Thursday in the month prior to publication. I deliberately held this issue until the last minute, expecting to hear from others, but their copy did not materialize. So the message is simple. If you want to see articles in your Newletter then you will have to contribute in a timely manner. Let us not allow the Newsletter to revert to a monthly meeting announcement.

THE SUBJECT IS MONEY, MONEY, MONEY

The Board of Directors of PPRS have decided after much deliberation to increase the dues to twenty dollars per year effective January 1, 1986. Any new members joining during the remainder of the present year will pay the current rate of ten dollars. Dues will then apply on an annual basis effective at the begining of the year. This will simplify matters for the Membership Chairman. The reason for the increase is mainly due to the fact that the present Newsletter costs as much to print as the dues produce so that any additional expenses must be covered by extra contributions of a small number of members. We want to be able to provide exceptional services (e.g. high speed linking) and funds are needed for this type of activity.

An official announcement from the Board is expected to be available for publication in next month's Newsletter. Suffice it to say that the Board does hope that every one will understand the reasons for the dues increase and wants to urge all of us to remain as supporting members.

MEETING ANNOUNCEMENT

The regular monthly meeting of PACIFIC PACKET RADIO SOCIETY is to be held on Tuesday, July 2, 1985 at the AMPEX Employees' Cafeteria. The Cafeteria is located on Broadway in Redwood City. From Highway 101 southbound, take the Woodside Road exit to Broadway, which is the first traffic light you will see. Turn left on Broadway and drive south about one mile. The AMPEX Cafeteria is a glass-walled building in a fountain-and-pool area on your right. Ample parking on both sides of Braodway. Note the new meeting time: 7:30 PM.

Rich Collins, NT6V, Editor

New version of the W0RLI mailbox program.

By the time you read this, WB5VUL-1 should be running version 9.3 of the W0RLI mailbox program. This version provides several useful enhancements, most notably the ability to perform administration of the mailbox over the air.

As a user, you'll notice the following changes:

1) The L command with no argument now lists NEW messages rather than ALL messages. New means messages received since the last time you connected to to the mailbox. To list ALL messages use L 0.

2) The L command now lists messages in newest to oldest order rather than oldest to newest order.

3) The mailbox maintains a user file. This file contains information about when a user connected last and the user's name.

Using 6264 chips in the VADCG daughter board

The VADCG daughter board permits the VADCG terminal node controller to be expanded past its original 4K or EPROM and RAM space. Using 64K bit chips (2764 EPROMs and 6264 static rams), both the EPROM and RAM space can be expanded to 32K bytes. Now that a 2764 costs $2.75 and a 6264 costs $5.65 (Microprocessors Unlimited, (918)267-4961), there is no reason not to use these chips in the board. Unfortunately, even though the VADCG daughter board was designed to use these chips, there is a bug that prevents the board from using 6264s and working. When jumpered as described in the documentation, the EPROM and RAM address decoders place both the EPROM and RAM in the same locations! To fix this, you need to do the following:

1) Do NOT jumper pin 5 to 12 on the RAM configuration jumper JP-6 as described on page 15 of the documentation.

2) On the 74LS138 RAM address decoder U39, make a solder bridge between pins 3 and 4.

Once these changes are made the EPROM address space will be in the first 32K and the RAM address space will be in the second 32K.

If you need EPROMs programmed for this board, send me one 2764, C/O Pacific Packet Radio Society, PO Box 51562, Palo Alto, CA 94304. Be sure to include return postage. Include your call and how much RAM memory you are installing on the board so I can build the code with those parameters.

PROBLEMS WITH FULL 5 KHz DEVIATION

Stuart E. Neblett, K6VCO
Pacific Packet Radio Society

Most FM transmitters come from the factory with their internal deviation limiters set set to 5.0 Khz. If you try to transmit data tones with almost full 5KHz modulation, the deviation limiters will begin to take action and distort your data tones. The amplitude distortion is not very important for AFSK 202 modem data but any phase distortion will bias your data and even more so with higher speed modems. The two possible solutions are to reset your deviation limiters to say 6.0 KHz and to only furnish enough modulation audio level for 5Khz of deviation; or to reduce your modulation audio level to below where the deviation limiters have effect, about 4KHz. The second method is more convenient if you are still going to use the transmitter for voice, and the 4KHz deviation has some advantages which I will try to explain.

The actual bandwidth of a FM modulated signal is more than either the deviation or the two sidebands of AM. The FM signal's power is distributed between the carrier and the many sideband pairs which are separated a multiple of the modulation frequency away from the carrier. The distribution of the signal power is a function of the modulation index (peak deviation divided by the modulation frequency) and is given exactly by a rather complicated formula called the Bessel function. The ARRL Handbook has a graph of it and most math books also have it as a table. Consider the values given as voltages, so square the values given for power.

Lets look at the power spectrum of a FM signal modulated with the 202 modem space tone of 2200 Hz.

	dev = 3.96 KHz (MI= 1.8)	dev = 4.84 KHz (MI= 2.2)
carrier	.3400 = -9.4dB	.1104 = -19.1dB
+ 2.2KHz sideband	.5815 = -4.7dB	.5560 = -5.1dB
+ 4.4KHz sideband	.3061 = -10.3dB	.3951 = -8.1dB
+ 6.6KHz sideband	.0988 = -20.1dB	.1623 = -15.8dB
+ 8.8KHz sideband	.0232 = -32.7dB	.0476 = -26.4dB
+11.0KHz sideband	.0043 = -47.3dB	.0108 = -39.3dB
+13.2KHz sideband	.0008 = -61.9dB	.0015 = -56.5dB

Even with the new 20KHz wide channels, full 5KHz deviation still puts a significant signal into the next channel slot. With an ERP of only 15 watts ten miles away, just that one -39.3dB sideband is 3uV into your two meter receiver tuned to the adjacent channel. By reducing your deviation to 4Khz, you can avoid any deviation limiter distortion and also reduce interference to adjacent channels by 8dB at the cost of only a 2dB reduction in demodulated audio.

* Path Loss = 36.6dB + 20 LOG(MHz) + 20 LOG(Miles)
  1.0 uV = -137dB Watts

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OAKLAND, CA
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